

## **Enallagma davisii, a New Species from Florida (Odonata).**

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In the Spring of 1941, while collecting around a lake in central Florida, three males and one female of a new *Enallagma* were taken. Later searches made in the same year and during the following Spring failed to disclose additional specimens. This new species is named for my good friend, Mr. Edward M. Davis, Director of the Thomas R. Baker Museum of Natural Science at Rollins College, Winter Park, Florida.

**Enallagma davisii** new species.

Color: blue and black.

*Holotype*, male: Head black, with blue markings; antennae blackish brown; labrum, anteclypeus, and postclypeus bright blue, except for a rather wide sutural band between the frons and postclypeus which extends over a large part of the postclypeus; frons blue to base of antennae; vertex black; post-ocular spots blue, rather large, almost circular, with a short arm projecting toward the midline; occiput black; rear of head blue.

Prothorax black on dorsum, with a transverse stripe across middle and two lateral spots on the anterior lobe, two on median lobe, and a small median spot and two lateral stripes on posterior lobe, all of these markings blue.

Pterothorax blue, black as follows: a wide, median, mid-dorsal line, narrowed posteriorly; a humeral stripe separated from middorsal by a pale stripe which is slightly wider than the humeral; a thread of black at second lateral suture and a larger elongated spot at base of third lateral suture followed by a hairstreak along it. Mesostigmal plates with large lateral blue spot separated from blue thoracic stripe by narrow black line. Legs brownish, femora and tibiae heavily streaked with black, appearing almost entirely black externally; coxae light, with large black mark at infraepisternal margin. Wings with veins and pterostigma dark brown or black; postnodals 11 in

front wings and 9 in hind wings;  $M_2$  arising between 4th and 5th postnodals, almost at 5th, in one front wing, and half way between 5th and 6th in the other, in hind wings arising between 3rd and 4th, almost at 4th.

Abdomen with terga blue, marked with black as follows: large basal spot and two small lateral apical spots on segment 1, apical spot and marginal ring of 2, apical fourth to fifth of 3 to 5, two small dorsal spots located on segment 3 at about one-fourth and one-half the length of the segment from base, apical half of 6, all of 7 except an interrupted basal ring, and all of 10. Segments 8-9 blue except for an irregular, lateral, apical spot on each side of 8 which extends half the length of the segment, and a very small and hardly noticeable, lateral, apical spot on each side of 9. Superior anal appendages black, with dorsal

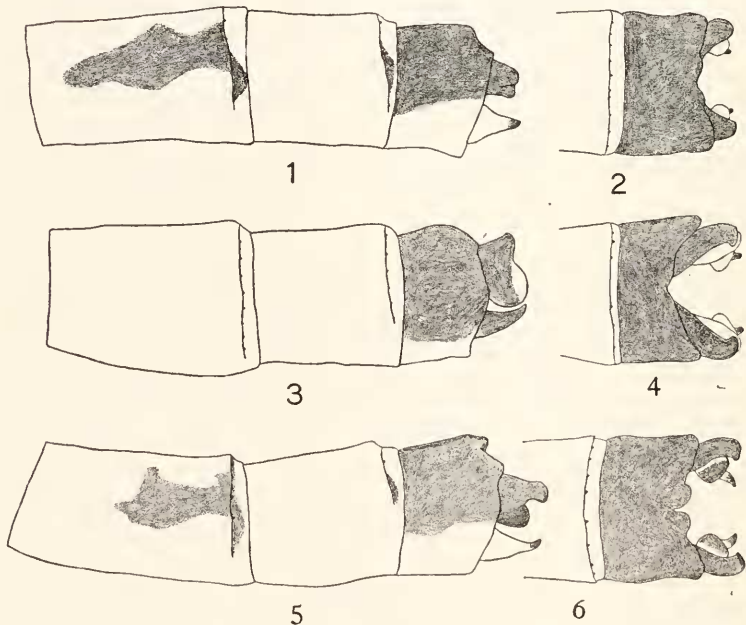


Fig. 1-2, *Enallagma laterale* Morse (Lateral and dorsal views of abdominal appendages of male). Fig. 3-4, *E. minusculum* Morse. Fig. 5-6, *E. davisi* new species.

and ventral arms, in profile view, about one-half the length of dorsum of 10; upper branch one and one-half times the length of lower, constricted before tip and knobbed; lower branch directed ventrally and medially, subrectangular in shape, with lower angles rounded, thicker than upper branch, although in strict profile view it may appear thinner because the lower branch is directed inward; inferior appendages as long as superiors, light brown, tipped with black.

Total length 31.5 mm.; abdomen, including appendages, 25; hind wing 17.

*Allotype*, female: In general, similar to male. Posterior lobe of prothorax without the small median spot (but this may not be constant); no dorsal pits on middle prothoracic lobes; black of legs very slightly if at all reduced; black spots present on coxae. Abdominal terga with black as follows: a large basal spot and two small lateral spots on segment 1, a median dorsal stripe on 2-10, narrowed abruptly at proximal end of 3-7 to form only a narrow streak and widened at distal end of segments. Sides of 8-10 pale, with the broad dorsal black stripe very noticeably reduced on the anterior half of segment 8. Superior anal appendages brown. Wings with light brown pterostigma; postnodals 11 in each front wing, 9 in hind wing;  $M_2$  arising between 4th and 5th postnodals, almost at 5th, in front wing, and between 3rd and 4th in hind wing, almost at 4th.

Total length 31 mm.; abdomen, including appendages, 24; hind wing 18.

*Paratype* No. 1, male: Differs from holotype only in minor, variable details. Postocular spots more cuniform than circular; abdomen with an extra rounded dorsal spot at anterior third of segment 3; 5 with an extra projection of the apical spot extending anteriorly to cover at least a third of segment, and an irregular lateral streak on one side reaching from apical spot almost to middle of segment, as well as a small black spot slightly anterior to middle; apical three-fourths of 6, and all of 7 black, except for a complete basal ring on the latter; lateral apical spots on 8 slightly narrower than in holotype;

$M_2$  arising in front wings between 4th and 5th postnodals, almost at 5th, and in hind wings half way between 4th and 5th.

Total length 32 mm.; abdomen, including appendages, 25.5; hind wing 17.

*Paratype* No. 2, male: Postocular spots more cuneiform than circular;  $M_2$  arising in front wings between 4th and 5th postnodals, almost at 5th, and between 3rd and 4th in hind wings, almost at 4th; apical two-thirds of abdominal segment 6 black; lateral apical spot of segment 8 slightly larger than in holotype.

Total length 31.5 mm.; abdomen, including appendages, 25; hind wing 17.

The specimens were collected by myself at a small grassy-edged lake about five miles north of Winter Park, Florida, just a few hundred feet west of the new Winter Park-Sanford highway. The second paratype was taken March 25, 1941, while the other specimens were collected March 21. Though the allotype was not found in copulation with the holotype, it was taken only a few feet away from it and is so similar that it can hardly be anything other than this species.

It may be worthwhile to note that the following species of Zygoptera were taken at the same lake with the types of *E. davisi*: *Enallagma sulcatum*, *E. laurenti*, *E. pollutum*, *E. concisum*, *E. doubledayi* (a single specimen), *Ischnura ramburii*, *I. kellikotti*, *Lestes vigilax*, and *Anomalagrion hastatum*.

The holotype and allotype are deposited in the Cornell University collection, while the first paratype is in the Williamson collection and the second in that of the Academy of Natural Sciences of Philadelphia.

Dr. Calvert informs me that there is a male specimen in the collection of the Academy of Natural Sciences of Philadelphia which is apparently of this new species. It was taken at Lake Ellis, North Carolina, May 14, 1906. He states that the pale postocular spots are smaller than those in paratype No. 2 of *E. davisi* which he saw, and elliptical instead of cuneiform. It is also a little smaller, abdomen, 23.5 mm. and h. w., 15.5 mm.

The following table of comparisons, made by Dr. P. P. Calvert in a study of types, is quoted from a letter:

	<i>E. laterale</i> paratype [?] <sup>1</sup>	<i>E. davisi</i> sp. nov. paratype	<i>E. minusculum</i> paratype [?] <sup>2</sup>
Superior appendages (profile view)	$\frac{1}{3}$ as long as segment 10, the two branches subequal in length.	$\frac{1}{2}$ as long as 10, upper branch $1\frac{1}{2}$ times as long as lower branch.	" $\frac{1}{2}$ as long as 10"; "lower branch projecting a little beyond the upper, much expanded, directed downward and inward."
	Upper branch not constricted before its apex and therefore not knobbed. Lower branch not as thick as upper branch.	Upper branch constricted before its apex and knobbed at tip. Lower branch thicker than upper branch.	"Upper branch one-third as broad" (as lower).
Inferior appendages	Projecting distinctly beyond the level of the tips of the superior appendages.	Projecting only as far as the level of the tips of superior appendages.	"Equal in length to the superiors."
Coxae	With no black mark <sup>3</sup> (some brown on 3rd coxa).	With a black mark at the infra-episternal margin.	With a brown mark at the infra-episternal margin.
Stripes on legs	Pale brown	Black	Black
Wing-veins and pterostigma	Pale brown	Dark brown or black	Pale brown
Postnodals f.w.	10	11	10
Postnodals h.w.	8	9	9 (right), 8 (left)
Abdomen	20.5-22 mm. (Morse)	25	20 (Morse)
Hind wing	15-16 mm. (Morse)	17	14-15 mm. (Morse)

<sup>1</sup> While the type specimens of *E. laterale* and *E. minusculum* studied in this connection by Dr. Calvert are referred to as "paratypes," it should be noted that in Morse's collection at the Museum of Comparative Zoology at Harvard no holotypes of those species are designated. Dr. Nathan Banks tells me that the specimens are all cotypes.

<sup>2</sup> "Four terminal segments of abdomen missing. Characters taken from Morse's original description." P. P. C.

<sup>3</sup> Four undoubted specimens of *E. laterale*, two of them cotypes, studied by the writer show dark marks at the bases of the coxae.

In studying a series of ten males of *E. minusculum*, all from Centerville, Massachusetts, August 4, 1941, several things of interest were noted. *E. minusculum* lacks the light spot on the dorsum of the median prothoracic lobe and also the dark mark on the side of abdominal segment 8 which is characteristic of both *laterale* and *davisi*. It is evident that there is great variation in the size and shape of the postocular spots, some being almost circular, while others are more nearly cuneiform or elliptical. In checking the number of postnodal cross-veins in this same series of males, I find that in 12 of 20 hind wings there are 8, while in the other 8 wings there are 9. Of 20 front wings there are 14 with 10 and 6 with 11 postnodals.

The female of *E. laterale* is unknown. Several differences have been noted between the allotype of *davisi* and females of *minusculum*. The dorsal pits on the median lobe of the prothorax are absent in both species, while the light dorsal spots present on this lobe in *davisi* are not found in *minusculum*, although one specimen of the latter species seems to show an indication of such marks. The black of the dorsum of abdominal segment one extends from the base to the apex in *minusculum*, while in *davisi* there is only a basal black spot occupying about one-half of the segment. In *minusculum* segments 8 to 10 are largely blue or brownish on the sides, the black of the dorsum having a uniform width, while in *davisi* the black of the dorsum of 8 is reduced on the basal half to a narrow streak. In *minusculum* there are 9 postnodals in the front wing, 8 in the hind; in *davisi* there are 11 in the front and 9 in the hind. The female of *davisi* is also much larger than that of *minusculum*; the measurements are, *davisi*, total length 31 mm. and hind wing 18 mm., *minusculum*, total length 25 mm. and hind wing 15 mm.

I wish to express appreciation to Mrs. Howard K. Gloyd, who compared *E. davisi* with all the species of *Enallagma* in the Williamson collection and decided it was new, and most closely related to *E. laterale* Morse; to Dr. P. P. Calvert, who compared it with type material of *E. laterale* Morse and *E. minusculum* at the Academy of Natural Sciences of Philadelphia; and to Dr. D. J. Borror and Mr. E. M. Davis for material in this genus.